

Application Serial No. 10/602,957
Reply to Office Action of September 22, 2004

PATENT
Docket: CU-3270

Amendments To The Claims

The listing of claims presented below will replace all prior versions, and listings, of claims in the application.

Listing of claims:

1. (currently amended) A vertical alignment mode liquid crystal display device which comprises:

upper and lower substrates which are disposed opposite one another at the desired interval;

a liquid crystal layer sandwiched between the upper and lower substrates and formed of liquid crystals with negative dielectric anisotropy;

an insulating film formed on the inner surface of the lower substrate and having a **rectangular or square** hole formed therein;

a jagged pixel electrode which is formed on the insulating film, wherein the pixel electrode partially but not completely covers the hole;

a counter electrode which is formed on the inner surface of the upper substrate;

vertical alignment films which are interposed between the pixel electrode and the liquid crystal layer and between the counter electrode and the liquid crystal layer, respectively; and

polarizers which are attached on the outer surfaces of the upper and lower substrates, respectively, in such a manner that their polarizing axes cross each other.

2. (cancelled)

3. (original) The vertical alignment mode liquid crystal display device of Claim 2,

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wherein the hole has a height of less than 2 μm , a length of shorter side of less than 5 μm , and a wall angle of 10-90 degrees.

4. (original) The vertical alignment mode liquid crystal display device of Claim 1, wherein the pixel electrode is formed in such a manner that the ratio between a portion of the hole covered with the pixel electrode and a portion of the hole non-covered with the pixel electrode is 1:1-5:1.

5. (original) The vertical alignment mode liquid crystal display device of Claim 1, wherein the pixel electrode is formed in such a manner that the interval between two adjacent pixel electrodes is less than 10 μm .

6. (currently amended) The vertical alignment mode liquid crystal display device of Claim 1, wherein the hole is positioned at ~~both of~~ a concave portion and another such hole is positioned at a convex portion of the jagged pixel electrode.

7. (original) The vertical alignment mode liquid crystal display device of Claim 1, which further comprises phase compensation plates interposed between the upper substrate and the adjacent polarizer and between the lower substrate and the adjacent polarizer.

8. (original) The vertical alignment mode liquid crystal display device of Claim 7, wherein the phase compensation plates are monoaxial phase compensation plates or biaxial phase compensation plates, in which the monoaxial phase compensation plates have a phase delay value ranging from 40 to 800 nm, and the biaxial phase compensation plates have a phase delay value ranging from 150 to 250 nm.

9. (previously presented) The vertical alignment mode liquid crystal display device of Claim 1, wherein the liquid crystals have a dielectric anisotropy of -2 to -10.

10. (previously presented) The vertical alignment mode liquid crystal display

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device of Claim 1, wherein the liquid crystal has a thickness of 2-6 μm , and the thickness of the liquid crystal layer times the refractive index anisotropy of the liquid crystals is 200-500 nm.

11. (previously presented) The vertical alignment mode liquid crystal display device of Claim 1, wherein the liquid crystal layer come in contact with the lower substrate through the uncovered portion of the hole.